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Long-distance dispersal of a sedentary Andean flycatcher species with a small geographic range, *Ochthoeca piurae* (Aves: Tyrannidae)

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Abstract: We report a Piura Chat-Tyrant (*Ochthoeca piurae*) ~300 km south of its known range. This record was unanticipated because the species is sedentary and restricted to a narrow eco-climatic zone in valleys of the dry western Andes of northwestern Peru. Southward dispersal would require crossing broad areas of unsuitable habitat. Riparian zones of the western Andes have been heavily impacted by humans over millennia. This observation suggests that native songbirds may be able to expand their distributions along the flanks of the Andes if woody vegetation is protected or restored.

Key words: deforestation, Lima, songbirds, Peru, dispersal, endemic, Andes

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The Piura Chat-Tyrant (*Ochthoeca piurae* Chapman, 1924) is a small flycatcher that is endemic to west slope drainages of the Andean Cordillera in northwestern Peru. It occurs in semi-humid forest patches and shrub-by habitat in a narrow elevational band (1,400–2,850 m), between latitudes of ~5.4° S (Abra Porculla area, Piura) and ~9.5° S (Huarmey Valley, Ancash), and is report-edly sedentary and locally distributed within its range (Koepcke 1961; Koepcke 1964; Fjeldså and Krabbe 1990; Fitzpatrick et al. 2004; Schulenberg et al. 2007; Ridgely and Tudor 2009; Sullivan et al. 2009; Schulenberg 2010; GBIF 2013).

The Piura Chat-Tyrant is classified as Near Threatened, due to its limited geographic range (ca. 201,000 km^2; Heming et al. 2013), a perceived trend toward population decline (Birdlife International 2012), and human-mediated loss of semi-humid forest habitat throughout its range. Deforestation and conversion to agriculture over recent millennia, in combination with extreme El Niño Southern Oscillation (ENSO) events, have contributed to dramatic landscape change and a drying climate on the west slope of the Peruvian Andes (Young and Lipton 2006; Beresford-Jones et al. 2009). Once extensive montane forests from southern Ecuador to northwestern Peru have been fragmented into smaller discontinuous patches (Weigend et al. 2005; Schmitt et al. 2013) that contain isolated populations of Piura Chat-Tyrants and other endemic species.

Here we present a notable record of a Piura Chat-Tyrant in the Santa Eulalia Valley, Department of Lima, approximately 300 km south of the closest populations. This finding demonstrates the ability of this species to disperse despite apparent barriers of inhospitable habitat.

At 1730 h on 23 January 2015, MJB, EJB, and EBO were conducting a comparative study of avian adaptation to altitude when they incidentally mist-netted a Piura Chat-Tyrant in the Santa Eulalia Valley, Department of Lima, Peru, on riparian agricultural land that is owned and managed by the community of San Pedro de Casta (Viquil; 11°48.15′ S, 076°37.38′ W; WGS 84; 1,650 m elevation; Figure 1). The site was situated along a narrow riparian corridor surrounded by steep, scrubby hillsides. The habitat consisted of a relatively flat, fluvial terrace with small alfalfa fields, brushy hedgerows, and large trees shading an irrigation canal (Figure 2). Trees at the site have been carefully maintained for erosion control, and the community prohibited tree-cutting.

The bird was identified in the field on the basis of its small size (8.63 g), entirely white supercilium and limited white on the forecrown, broad cinnamon tips to the greater and median covets, white fringing on outer web of outermost primaries, and entirely brown back (Figure 3). This combination of features distinguished it from *O. leucophrys* and specifically *O. l. leucophrys* which can look very similar. We decided to collect the bird because we judged that (1) the sacrifice of this long-distance dispersing individual would not affect

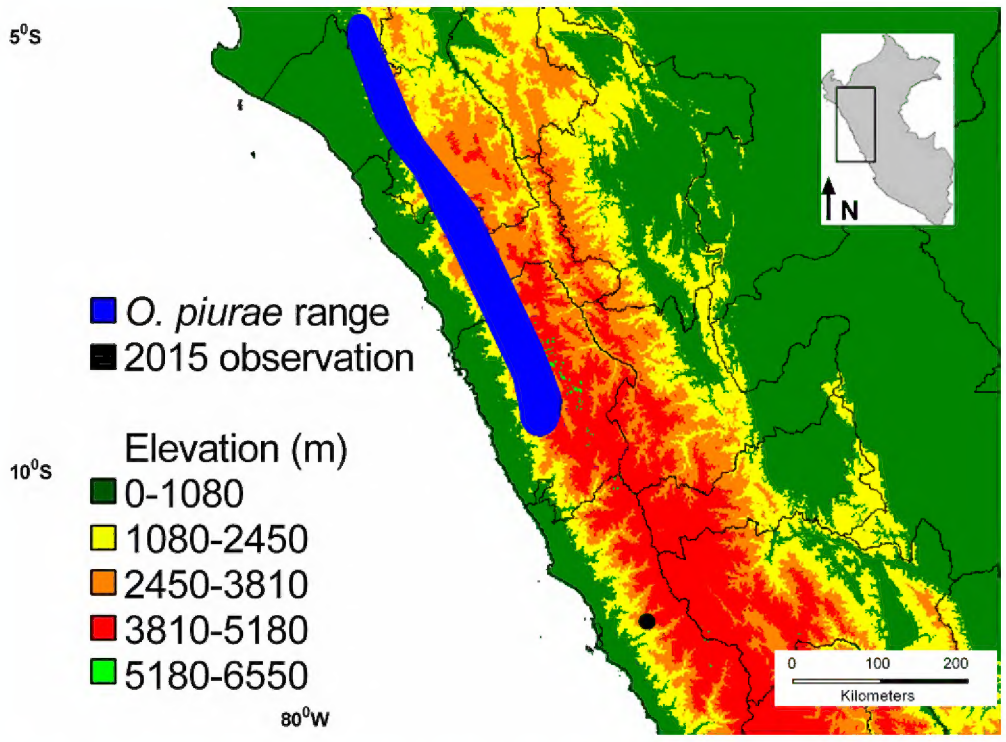

Figure 1. *Ochthoeca piurae* range map, courtesy of Birdlife International (2012). The black circle represents Viquil where the Piura Chat-Tyrant was captured in the Department of Lima on 23 January 2015. This record is approximately 300 km south of the species southernmost known populations in south-central Ancash.

Figure 2. Typical habitat at Viquil.

population viability, (2) it would have long-term value to biodiversity science as a multi-part specimen with complete data and frozen tissues (Rocha et al. 2014), and (3) we were able to do so legally under permit 0280-2014-MINAGRI-DGFFS/DGEFFS. EBO dissected and prepared the specimen, which was a female of undetermined age (skull 100% ossified, ovary 5×2 mm, no Bursa of Fabricius, moderate fat). The skin and tissue is deposited at CORBIDI (Lima, Peru), with duplicate tissue sample to be cryopreserved at the University of New Mexico Museum of Southwestern Biology (Albuquerque, NM, USA). The specimen catalog number is MSB:Bird:43588 and its complete data can be found at this permanent URL: http://arctos.database.museum/guid/MSB:Bird:43588. We examined specimens of *O. piurae* and its close relative, *O. leucophrys*, from the Museum of Southwestern Biology (MSB). *O. leucophrys* is larger (male; =14.1 g, S.D.=1.0, n=16; female; $\bar{x}$ = 13.9g, S.D.=2.7, n=16) compared to *O. piurae* (male; 9.0 g, n=1; female; $\bar{x}$ = 8.8 g, S.D.=0.1, n=4).

Figure 3. *Ochthoeca piurae* (MSB:Bird: 43588), captured at Viquil.

The individual Piura Chat-Tyrant that we captured in the Santa Eulalia Valley represents the first record of this species for the Department of Lima. This locality is approximately 300 km south of the Huarmey Valley in Ancash, currently the southernmost extent of this species range (Koepcke 1961; Koepcke 1964; Fjeldså and Krabbe 1990; Fitzpatrick et al. 2004; Schulenberg et al. 2007; Ridgely and Tudor 2009; Sullivan et al. 2009; Schulenberg 2010; GBIF 2013).

The Piura Chat-Tyrant has a small, elevationally restricted range that is exclusively tied to west slope Andean drainages that harbor sufficient relictual or secondary woody vegetation (Schulenberg et al. 2007; Schmitt et al. 2013). This narrowly defined habitat makes the occurrence of a single individual 300 km south of the species' known range remarkable, especially considering that it would have had to traverse arid, sparsely vegetated terrain. Although dispersal is notoriously difficult to study, sedentary tropical songbirds tend to have exceptionally poor dispersal abilities (Develey and Stouffer 2001; Laurance et al. 2004; Moore et al. 2008). Long distance dispersal events are difficult to detect, but are thought to be important drivers of tropical avian speciation (Smith et al. 2014). ENSO events apparently increase the frequency of vagrant songbirds to the Galápagos (Curry and Stoleson 1988); accordingly, it is possible that unusually warm sea surface and air temperatures in western Peru during early 2015 made this dispersal event more likely. We suspect that this was a dispersing individual because the birds of the

Santa Eulalia Valley have been relatively well studied by ornithologists and birders (over 200 checklists have been submitted to eBird.org as of October 2015; Sullivan et al. 2009). However, we cannot rule out the possibility that the species has a larger range than currently known, and particularly that undetected resident populations may exist in any of the seldom visited valleys between Santa Eulalia and Huarmey. Restoration or preservation of habitat corridors along these west slope drainages may allow the Piura Chat-Tyrant and other native species to disperse and colonize new suitable habitat beyond their current distributions.

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